

Translation

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PATENT COOPERATION TREATY

PCT/JP2003/010473



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference KRC-75PC	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2003/010473	International filing date (day/month/year) 19 August 2003 (19.08.2003)	Priority date (day/month/year) 20 August 2002 (20.08.2002)
International Patent Classification (IPC) or national classification and IPC B22D 11/10, 41/52, 41/54, C04B 35/06		
Applicant KROSAKIHARIMA CORPORATION		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☐ Box No. VII Certain defects in the international application
 - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 19 March 2004 (19.03.2004)	Date of completion of this report 01 November 2004 (01.11.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2003/010473

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ The international application as originally filed/furnished

- ☐ the description:

pages _____, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

- ☐ the claims:

pages _____, as originally filed/furnished

pages* _____, as amended (together with any statement) under Article 19

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

- ☐ the drawings:

pages _____, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PCT/JP 03/10473

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1, 2	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1, 2	NO
Industrial applicability (IA)	Claims	1, 2	YES
	Claims		NO

2. Citations and explanations

The documents cited in the international search report are referred to as "document 1" to "document 4" below.

Document 1: JP 7-40015 A (Shinagawa Refractories Co., Ltd.), 10 February 1995

Document 2: JP 61-256961 A (Shin Nihon Kagaku Kogyo Kabushiki Kaisha), 14 November 1986

Document 3: JP 4-28462 A (Harima Ceramic Co., Ltd.), 31 January 1992

Document 4: JP 6-247767 A (Shinagawa Refractories Co., Ltd.), 6 September 1994

Claims 1 and 2

The invention set forth in claims 1 and 2 does not involve an inventive step in the light of documents 1 and 2.

Document 1 (fig. 1 (a) and paragraphs 0011 to 0026) sets forth a method of manufacturing an immersion nozzle for continuous casting, wherein a "ZrO₂-C material" is used as the powder line portion, and a refractory comprising mainly calcium zirconate clinker is installed in the inner holes, and said refractory supplies CaO according to the quantity of alumina in the steel.

In addition, document 2 (page 2, upper left column, line 14 to upper right column, line 3 and page 3, upper left column, line 12 to page 8, upper left column, line 13) indicates that calcia clinker containing for example 97.20% by weight or 69.60% by weight of CaO is heated in the presence of CO₂, carbonating the surface of CaO to form a CaCO₃ layer with a thickness of 0.05 to 4μm, thereby improving the take-up resistance of the CaO which is removed to a large degree by the Al₂O₃ in molten steel.

That being the case, it would not be particularly difficult for a person skilled in the art to apply the calcia clinker which as formed a CaCO₃ layer described in document 2 as an alternative to the aforementioned refractory set forth in document 1.

Moreover, document 3 (fig. 2 and page 7, upper right column, line 19 to lower left column, line 9 and page 6, upper left column to upper right column) sets forth in the same way as document 1 a method for manufacturing an immersion nozzle for continuous casting, wherein a "ZrO₂-C refractory" is used in the "powder line portion (6)", and a "ZrO₂-CaO-C refractory (fused substance)" is used in the inner holes, and document 4 (paragraphs 0004 to 0005) indicates that the calcia surface is reacted with carbon dioxide to create a coating of calcium carbonate with a thickness of 1μm or less, and preventing the take-up of CaO.